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# KANSAS DEPARTMENT OF HEALTH & ENVIRONMENT

## PROCEDURE FOR THE PRESSURE MECHANICAL INTEGRITY TEST OF A CLASS III SALT SOLUTION MINING WELL

**Procedure #: UICIII-6**

Narrative:

The purpose of this test is to evaluate the internal mechanical integrity of the well. A well has internal mechanical integrity if there is no significant leak in the casing. Internal mechanical integrity is checked by conducting a hydraulic pressure test of the casing and monitoring for a pressure loss. The test shall be witnessed by a representative of KDHE, therefore the schedule for the test shall be mutually agreed upon.

A plan for this test shall be submitted to KDHE for review and approval prior to conducting the test. Include a diagram of the surface and subsurface well completion. The plan shall include a prognosis and schedule for conducting the test. Plan approval shall be obtained from KDHE before commencing the test. K.A.R. 28-46-33 establishes the mechanical integrity testing requirements.

Procedure:

1. Depressure the well.

2. Pull any tubing strings from the well.

3. Set a retrievable bridge plug or packer immediately above the cavity for the purpose of pressure testing the casing. The setting depth shall have the approval of KDHE. Integrity must be demonstrated at least to a depth equal to the top of the salt. Provide information describing the packer or plug and the suitability of the packer or plug for use in this pressure test. The packer or plug must be capable of making a tight seal to allow the casing to be hydraulically pressure tested.

4. Hydraulically pressure test the casing. The liquid pressure placed on the casing is to be monitored for the purpose of determining integrity of the casing. It shall be demonstrated to the KDHE representative that the casing is liquid filled. This can be demonstrated to the KDHE representative upon completion of the test.

5. The well must be in thermal equilibrium before commencing the test.

6. Once the casing has been pressurized, vent as much of the air as possible from the well. Repressure as necessary. Once the casing has been pressurized for the test, the casing shall be isolated from all external artificial pressure sources capable of introducing pressure to the casing.

7. The minimum wellhead casing test pressure shall be 150 psi or 1.5 times the average maximum operating injection pressure at the wellhead, whichever is greater.

(Over)

8. A description of the pressure gauge to be used to monitor the test pressure must be provided. The gauge must have a scale such that the test pressure is 40%-60% of full scale. The scale shall measure pressure in increments of no more than 2 psi per division. The gauge shall be tested for accuracy for the mechanical integrity test. A document with a description of the test, the test date, amount of error found on the gauge during the test and a description of corrective action such as recalibration shall be provided to the KDHE representative at the time of the mechanical integrity test. It shall be demonstrated the gauge is functioning properly.

9. The test shall be a minimum one (1) hour in duration.

10. The test shall be witnessed by KDHE.

11. A pressure loss of equal to or less than 5% of the initial test pressure is a satisfactory test and indicates the well has internal mechanical integrity at the time of the test. A pressure increase of greater than 5% of the initial test pressure is not acceptable and may indicate the well has not reached thermal equilibrium.

12. If a satisfactory test is not obtained the well shall remain out of service until corrective action approved by KDHE has been taken and a satisfactory mechanical integrity test conducted. The location of the leakage must be determined and the impact to the environment evaluated. An environmental remediation plan and implementation schedule and a plan for repair of the well may be required to be submitted to KDHE for review and approval. No work shall commence until plan approval has been obtained from KDHE.

Failure to follow the KDHE approved MIT plan may result in cancellation of the test and shut-in of the well until the MIT is rescheduled and conducted to the satisfaction of KDHE.

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